

Lead Poisoning Burden and Screening Among Children Under 6 Years of Age, Tennessee, 2005 – 2015

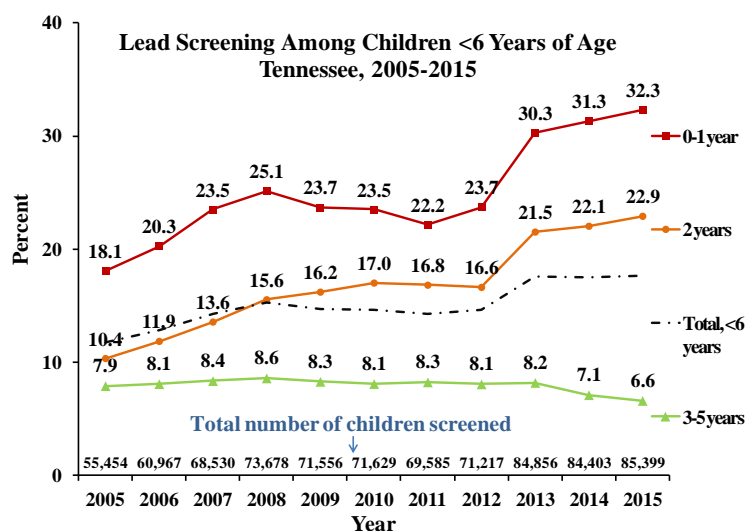
Tennessee Childhood Lead Poisoning Prevention Program

August 2016



Lead poisoning is the leading environmental threat to the health of America's children. Children under the age of six are especially vulnerable to lead poisoning, which can affect mental and physical development and even be fatal if at very high levels. No safe blood lead level (BLL) in children has been identified. Most children encounter lead in their own homes due to exposure to lead-based paint, which was routinely used in homes until banned by the federal government in 1978. As most children show no symptoms of illness, lead poisoning is diagnosed via a simple blood test.^{1,2}

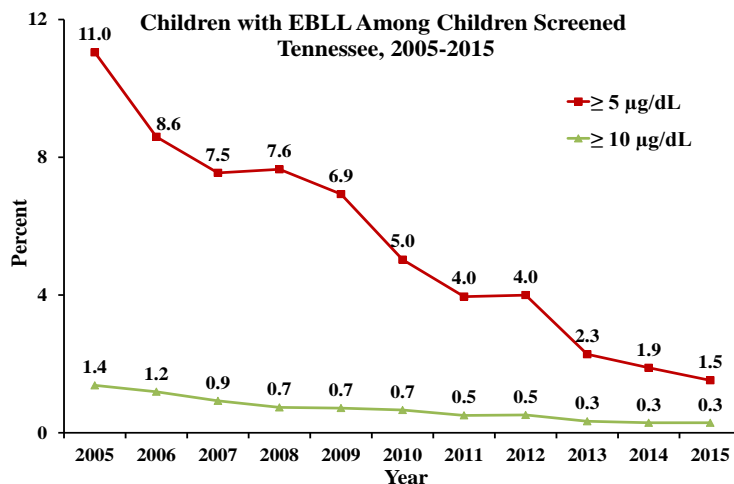
The Tennessee Childhood Lead Poisoning Prevention Program (TN CLPPP) was established in 2001 with the goal of eliminating elevated blood lead levels (EBLL) and reducing the mean BLL in children. TN CLPPP collaborates with the University of Tennessee Extension to inform and educate medical providers and the general public about the dangers of lead poisoning, to track blood lead screening tests and results and to manage cases with EBLL. This report describes the blood lead screening and the burden of lead poisoning among children under 6 years of age in TN from 2005 to 2015.



- In 2015, 85,399 children under age 6 were screened for BLL, an increase by 54% from 2005 when 55,454 children were screened.
- The screening rate was highest among children 0-1 year, followed by 2-year olds and then 3- to 5-year olds. The screening rate increased over time for the two younger groups, which reflects improved compliance with TN CLPPP screening guidelines.
- Among those screened, the percent of children with BLL $\geq 10\mu\text{g/dL}$ decreased by 79%, from 1.4% in 2005 to 0.3% in 2015.
- In 2012, the Centers for Disease Control and Prevention lowered the screening cutoff for public health action from $\geq 10\mu\text{g/dL}$ to $\geq 5\mu\text{g/dL}$. The percent of screened children with BLL $\geq 5\mu\text{g/dL}$ dropped by 86% between 2005 and 2015, from 11.0% to 1.5%.

Data Summary

- In 2015, 85,399 children <6 years of age were screened for BLL.
- The number and percent of children screened increased approximately 50% from 2005 to 2015.
- Among those screened in 2015, 1.5% (1,301 children) had BLL $\geq 5\mu\text{g/dL}$ – a decrease of almost 90% compared to 2005 (11.0%).
- There were 333 children with confirmed BLL $\geq 5\mu\text{g/dL}$ and 91 with confirmed BLL $\geq 10\mu\text{g/dL}$ in 2015.
- The screening rate from 2013-2015 was 17.6% in Tennessee, ranging from 6.7% in Maury to 48.0% in Perry County.
- One in thirteen zip code areas had $\geq 27\%$ houses built before 1950. In comparison, almost one in four children confirmed with EBLL $\geq 10\mu\text{g/dL}$ resided in those zip code areas.

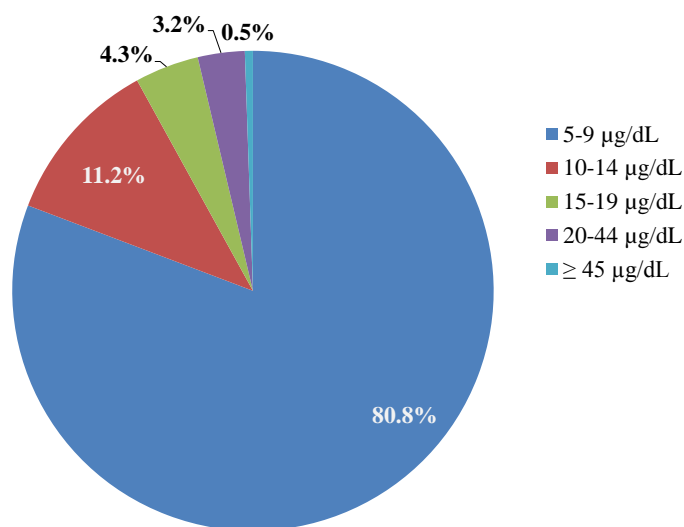


¹ Childhood Lead Poisoning Prevention Program, University of Tennessee (<https://ag.tennessee.edu/fcs/Pages/Home/LeadPoisoningPrevention.aspx>).

² Mayo Clinic. (<http://www.mayoclinic.org/diseases-conditions/lead-poisoning/basics/definition/con-20035487>).

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Children with EBLL, Tennessee, 2015



- Among all children screened in 2015, 1301 children were identified with BLL $\geq 5\mu\text{g/dL}$, 19.2% of which had BLL $\geq 10\mu\text{g/dL}$.
- Among children screened at age 0-1, 2 and 3-5 years, 1.4%, 1.7% and 1.8% had BLL $\geq 5\mu\text{g/dL}$, respectively.
- 333 were confirmed with BLL $\geq 5\mu\text{g/dL}$, and 91 had confirmed BLL $\geq 10\mu\text{g/dL}$. These 91 children represent 27.3% of confirmed EBLL cases and 0.1% of all screened children.
- Among children with confirmed BLL $\geq 10\mu\text{g/dL}$, 51 (56%) were 0-1 year old, 23 (25%) were 2 years old and 17 (19%) were 3-5 years old.

Number of Children with EBLL by Age and BLL, Tennessee, 2015

Age (year)	# of children screened	# of children with EBLL ($\mu\text{g/dL}$)						# of children with confirmed EBLL ($\mu\text{g/dL}$)					
		≥ 5	5-9	10-14	15-19	20-44	≥ 45	≥ 5	5-9	10-14	15-19	20-44	≥ 45
0-1	50,761	706	563	81	30	27	5	174	123	34	9	7	1
2	18,437	309	249	33	16	11	0	92	69	15	6	2	0
3-5	16,201	286	239	32	10	3	2	67	50	12	4	1	0
Total	85,399	1,301	1,051	146	56	41	7	333	242	61	19	10	1

Who should be screened?

- Children at 12 and 24 months of age*
- Children 36-72 months old without a documented blood lead level*
- Children whose parent/guardian requests a blood lead level
- Children whose parent/guardian answers “yes” or “don’t know” to any questions on the risk assessment questionnaire used at well-child checks between 6-72 months of age or when a child’s risk status changes

Recommended timing for a confirmatory test after an initial BLL $\geq 5\mu\text{g/dL}$ from a capillary sample[†]:

Screening Test Result ($\mu\text{g/dL}$)	Time Frame for a Confirmatory Test
5-9	1-3 months
10-44	1 week - 1 month
45-59	48 hours
60-69	24 hours
≥ 70	Urgently as emergency test

In Tennessee, all blood lead test results are required to be reported to the State:

- For blood lead levels $\geq 5\mu\text{g/dL}$: Report results within 1 week of receipt
- For blood lead levels $< 5\mu\text{g/dL}$: Report results within 1 month of receipt
- Report should include patient's first and last name, date of birth, gender, race, ethnicity, resident address, county of residence, sample date, sample type, provider's name and phone number, and payment source

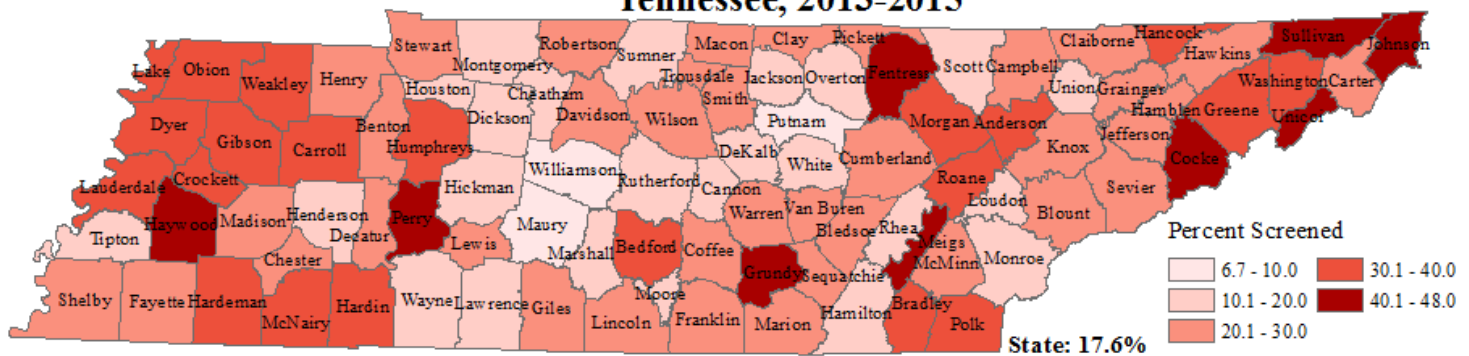
*Required for children enrolled in TennCare

[†]The higher the BLL on the screening test, the more urgent the need for confirmatory testing

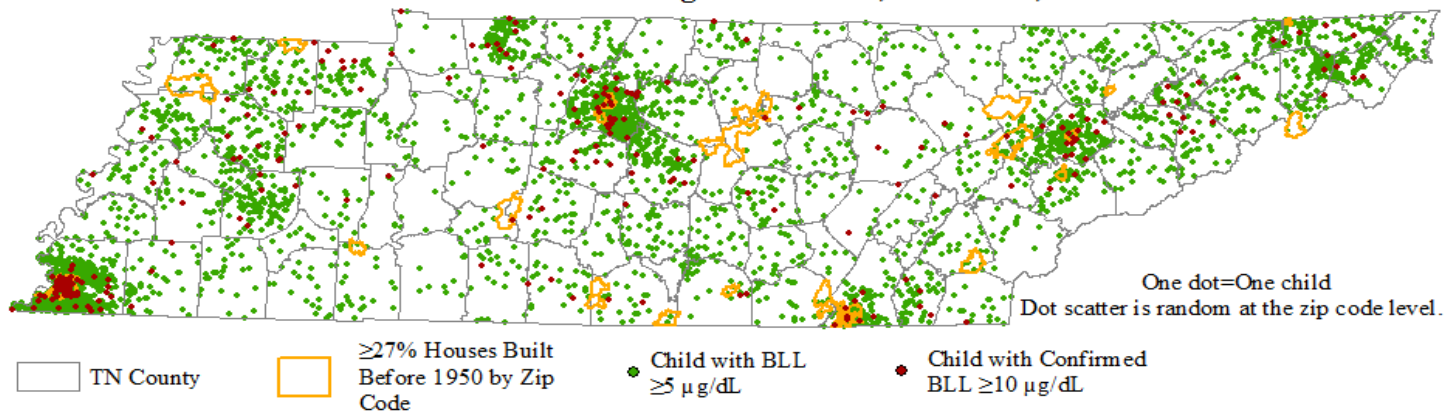
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- The statewide screening rate from 2013-2015 was 17.6%. Rates varied from county to county, ranging from 6.7% in Maury to 48.0% in Perry.
- Screening rates were generally higher in eastern and western Tennessee counties than those in the middle of the state.
- Screening rates for the four most populous metropolitan counties in Tennessee - Shelby, Davidson, Hamilton and Knox - were 30.0%, 27.0%, 19.6% and 26.4%, respectively. These counties had the largest number of children with BLL $\geq 5\mu\text{g/dL}$ as well as the largest number of houses built before 1950.
- Almost one in four confirmed cases with BLL $\geq 10\mu\text{g/dL}$ resided in zip codes with $\geq 27\%$ houses built before 1950, while only one in thirteen zip code areas had $\geq 27\%$ houses built before 1950, suggesting children living in the areas with higher density of older houses being at a higher risk of having confirmed EBL.

Lead Screening Rate among Children <6 Years of Age by County of Residence Tennessee, 2013-2015



Children <6 Years of Age with EBL, Tennessee, 2013-2015



Definitions:

- Screening test: A blood lead test for a child under 6 years who previously did not have a confirmed elevated blood lead level (EBL). A child may be screened in multiple years or even multiple times within a given year, but would be counted only once for each year.
- EBL: A single blood lead test (capillary or venous) at or above the reference range value of $5\mu\text{g/dL}$.
- Confirmed EBL $\geq 10\mu\text{g/dL}$: A child with one venous blood specimen $\geq 10\mu\text{g/dL}$, or two capillary blood specimens both $\geq 10\mu\text{g/dL}$ drawn within 12 weeks of each other.

Data Sources:

- Lead screening data: LeadTRK. Tennessee Childhood Lead Poisoning Prevention Program, Division of Family Health and Wellness, Tennessee Department of Health. Data were updated in June 2016.
- Population estimation data: Division of Policy, Planning and Assessment, Tennessee Department of Health.
- Housing data: 2014 American Community Survey 5-year estimates, US Census Bureau.

Suggested Citation:

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